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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,330	04/10/2007	Wolfgang Podszun	CH8473PCTUS	5774
34947	7590	03/18/2010		
LANXESS CORPORATION 111 RIDC PARK WEST DRIVE PITTSBURGH, PA 15275-1112			EXAMINER NEGRELLI, KARA B	
			ART UNIT	PAPER NUMBER
			1796	
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			03/18/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/588,330

Applicant(s)

PODSZUN ET AL.

Examiner

KARA NEGRELLI

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/CD)
Paper No(s)/Mail Date 03/19/2007; 03/15/2007
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

METHOD FOR THE PRODUCTION OF MONODISPERSED ION EXCHANGERS

CONTAINING PORES

DETAILED ACITON

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9-20 are rejected under 35 U.S.C. under 35 U.S.C. 103(a) as obvious over Mørk et al. (WO 99/19375), and further in view of Frazza et al. (US 5,147,937).

3. Mørk et al. teach a process for preparation of polymer particles comprising (a) obtaining a first substantially monodispersed particulate polymer seed having a particle size of preferably no more than 50 μm , (b) using said first seed material, performing a suspension polymerization to yield a second substantially monodisperse particulate polymer seed material having a mode size greater than that of the first seed particle and not more than 150 μm , and (c) using said second seed material, performing a suspension polymerization to yield a third substantially monodisperse particulate polymer seed material with a greater mode size. See page 4, line to page 5, line 15. The suspension polymerization steps (b) and (c) are performed at an elevated temperature (see examples of Mørk et al.).

4. Mørk et al. teach that the process may be used for the preparation of any particulate polymer, in particular styrenic homo- and copolymers and vinyl homo- and copolymers. Examples of appropriate monomers appropriate include vinyl aliphatic monomers such as esters of acrylic and methacrylic acids, acrylonitrile, and vinyl aromatic monomers such as styrene and substituted styrenes (page 7, lines 3-10). In the process according to Mørk et al., in a seeded polymerization, the growing seed is continuously contacting fresh monomer and initiator (page 9, lines 5-7). The initial substantially monodisperse polymer seed material used for the processes of the invention may be conveniently produced by any process which yields a substantially monodisperse polymer product, e.g. by a dispersion polymerization process performed in an organic solvent (page 8, lines 26-31) with a particle size which is most preferably from 10 to 20 μm (page 10, lines 30-35). Mørk et al. do not teach that the seed particles are made in the presence of a crosslinker or that the seed particles are crosslinked. Therefore, one of ordinary skill in the art would reasonably expect the seed particles to be noncrosslinked seed particles.

5. Mørk et al. teach that the initial seed particles are enlarged in a stepwise suspension polymerization process which involves combining an aqueous dispersion of the seed particles with an aqueous emulsion of a monomer or monomer mixture and a free radical polymerization initiator (page 11, lines 9-14). The monomer may comprise styrene or styrene derivatives and/or a non-styrenic comonomer (page 11, line 24 – page 12, line 1). In general, styrenes and styrene in particular is the predominant or only monomer used for growth of the seed particles (page 12, lines 8-11). Other

comonomers may include acrylic acids and esters (such as acrylic acid, methyl methacrylate, etc...) (page 12, lines 12-20).

6. Besides simple ethylenic comonomers, comonomers capable of cross-linking may also be used (but are not a required component). An example is divinyl benzene.

7. Suitable initiators include dibenzoyl peroxide, lauroyl peroxide, peroxy esters, or azo compounds such as azobisisobutyronitrile (which are the same as disclosed in the instant specification, see paragraphs [0071]-[0072] of the instant specification) which may be used in an amount of preferably 0.2 to 4% by weight relative to the monomer (page 12, line 35 - page 13, line 5). One or more stabilizers may also be present in the monomer mixture which is added to the seed particles, said stabilizer of which is preferably a water-soluble high molecular weight materials such as celluloses (cellulose ethers, polyols, or polyvinylalcohols (page 14, lines 1-7). See also, page 15, lines 9-13. This stabilizer material is the same as the dispersants described in instant claims 10-11 and paragraph [0085] of the instant application. The formed particles (after all suspension polymerization steps) may be treated with a flame retardant, or maybe be surface treated to attach other materials with a desired property (the beads may be functionalized). See page 18, lines 10-14.

8. Because the subsequent polymerizations taught by Mørk et al. teach a process for preparation of polymer particles comprising (a) obtaining a first substantially monodispersed particulate polymer seed having a particle size of preferably no more than 50 μm , (b) using said first seed material, performing a suspension polymerization to yield a second substantially monodisperse particulate polymer seed material having a

mode size greater than that of the first seed particle and not more than 150 μm , and (c) using said second seed material, performing a suspension polymerization to yield a third substantially monodisperse particulate polymer seed material with a greater mode size (See page 4, line to page 5, line 15), and because each subsequent polymerization step includes a monomer and initiator emulsion which may or may not comprise a crosslinking material such as divinyl benzene, it would have been obvious for one of ordinary skill in the art to use an emulsion which does not contain the crosslinking material for a first polymerization of the seed particles, and to use an emulsion of monomer and initiator which does contain a crosslinking material for a second polymerization. The resultant seed materials of Mørk et al. are swelled and formed into polymeric beads.

9. Besides being useful for the preparation of polymer beads, the substantially monodisperse particles of Mørk et al. are suitable for preparation of ion exchange resins (e.g. for water purification, which would require contacting the monodisperse material with water). Such resin beads generally require some degree of crosslinking (e.g. with divinyl benzene) of the polymer matrix after bead formation has occurred, e.g. by sulphonation by treatment with sulfuric acid to produce acidic ion exchange (cation exchanger) resin beads or by amination of a reactive comonomer used in the final stage or one of the later stages of polymerization to produce a basic ion exchange resin (anion exchanger). In general for ion exchange usage, bead sizes will be about 100 to 500 μm . See page 18, lines 15-34.

10. Mørk et al. further teach that a degree of porosity is required for some uses of the particles. This may be achieved by controlling the degree of crosslinking and adding a porogen such as toluene, pentane, or any other volatile or gas generating agent in the monomer emulsion used in the final stage or one of the later polymerization stages (page 19, lines 18-26).

11. Mørk et al. teach that monomer phase of the emulsion desirably makes up 30 to 60% by weight (page 15, lines 14-16). As mentioned above, the initiator is preferably present in an amount of 0.2 to 4% by weight (page 13, line 5). Non-styrenic comonomers (such as divinyl benzene if crosslinking is desired) may be present in the monomer emulsion in an amount of either 0 wt% or 1 to 40 wt% (page 12, lines 21-23 and lines 30-34). Mørk et al. do not expressly teach the amount of porogen which may be included in the final stage or one of the later polymerization stages (page 19, lines 18-26). However, Frazza et al. further teach a process of making uniformly sized polymer particles having a selected final particle size within the range of 1-50 microns, said process of which comprises the steps of combining water-insoluble monomer or monomer mixture with an aqueous dispersion of seed polymer particles, in the presence of an initiator and from 0 to 50% of a porogen, the percentage being based on the weight of monomers plus porogen (column 2, lines 15-30). The amount of porogen of Frazza et al. overlaps the instantly claimed amount of porogen. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951,

1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

12. It would have been obvious for one of ordinary skill in the art to use the amount of porogen disclosed in Frazza et al. in the process of Mørk et al. because the specific kind and percentage of porogen in the monomer mixture is selected according to the degree of macroporosity desired (See Frazza et al. (US 5,147,937), column 4, lines 64-67). Examples of monomers in Frazza et al. include styrene or substituted styrene (column 3, lines 27-28), and the seed particles may be uncrosslinked (column 3, lines 20-21). Examples of porogen include toluene and/or xylene (column 4, lines 63-64). It would have been obvious to one of ordinary skill in the art to use a higher amount of porogen (50 wt%) if a higher degree of macroporosity is desired, whereas if a lower degree of macroporosity is desired, a smaller amount of porogen (10 wt%) would be employed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARA NEGRELLI whose telephone number is (571)270-7338. The examiner can normally be reached on Monday through Friday 9:30 am EST to 6:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571)272-1302. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KARA NEGRELLI/
Examiner, Art Unit 1796

/RANDY GULAKOWSKI/
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